little more than to fill out the closing lines, and would have made the paper little longer. It will probably be a long time before any other author half so qualified as Dr. Brinton will try to cover the whole ground of American archæology.

MICROSCOPY.[1]

REVOLVING AUTOMATIC MICROTOME.—The microtome represented in the accompanying cut is the invention of Adam Pfeifer, mechanic and instrument-maker to the Biological Laboratory of the Johns Hopkins University.

The machine is designed to save time and labor in the preparation of series of sections, and to attain at the same time the greatest uniformity in the thickness of the sections.

The mechanism is very simple. The frame (Fig. *B*) contains a horizontal screw beneath the sliding carriage (*C*). The carriage carries the knife (*K*). This carriage is moved forward by turning of screw. Two arms of the frame support the axis (*J*) of the revolving wheel (*E*), to which the imbedded object is attached. The knife (*K*) is clamped in an upright position on the arms rising from the sliding carriage, so that the edge of the knife is in the same horizontal plane with the center of the axis (*J*). Thus, as the sliding carriage is moved by the screw, so the knife is moved to or from the revolving object. The carriage slides by means of grooves on raised tracks of the frame, and is not directly connected with the screw, but is simply pushed by nut (*N*). This arrangement makes it impossible that any slight eccentricity of the screw should cause a jolting of the carriage.

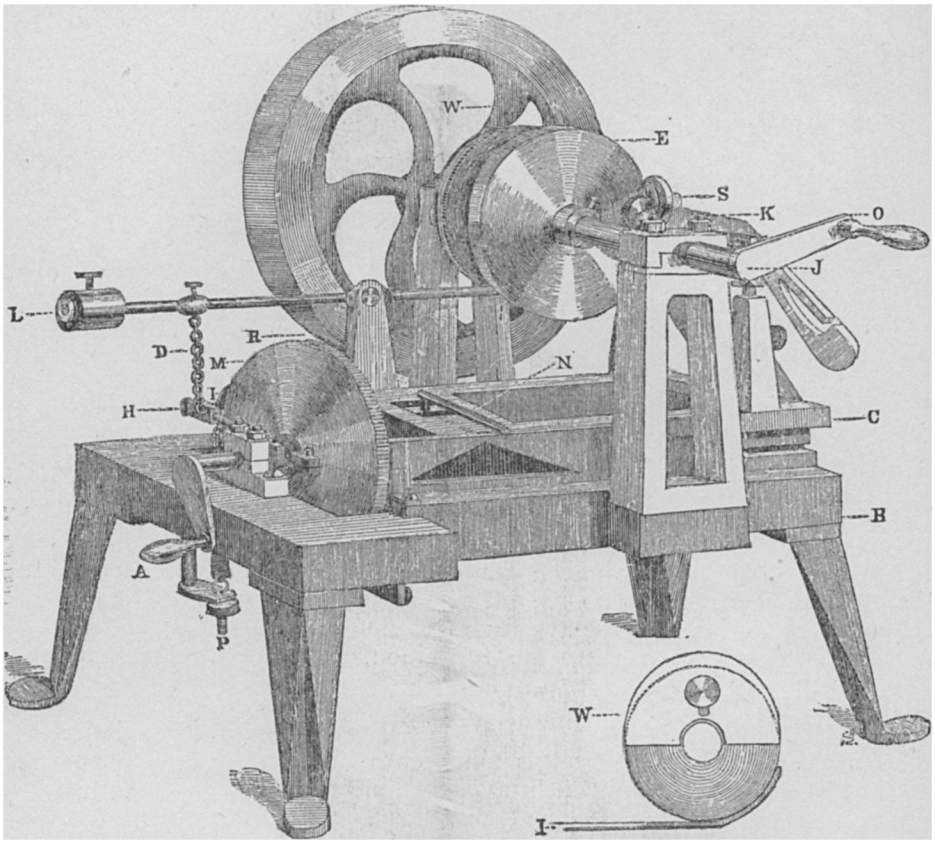
The head of the screw is a solid wheel (*M*) at the end of the frame, and has 250 ratchet-teeth on its circumference. The screw has twenty threads to the inch (= .025^{m}). The knife, therefore, is moved an inch by twenty revolutions of the screw; and as there are 250 teeth to the revolution, each tooth represents $\frac{1}{20 \times 250} = \frac{1}{5000}$ inch (.005^{mm}).

The handle (*O*) turns the axis (*J*), to which is attached the wheel (*E*). This wheel is four inches in diameter, and to it is fastened the clamp which holds the object to be cut. The axis also carries a fly-wheel and an adjustable eccentric wheel (*W*), which is figured apart in a corner of the illustration. This eccentric moves a lever (*L*), the long arm of which is connected with the small chain (*D*). The chain lifts a small lever (*H*), which works by means of a catch (*I*) on the teeth of the screw-head, causing the screw to revolve. The small lever is steadied and pulled back to its place by a spiral spring (*P*), while another spring-catch underneath the frame prevents the ratchet-wheel from turning back. By properly adjusting the eccentric wheel

[1] Edited by Dr. C. O. WHITMAN, Mus. Comparative Zoölogy, Cambridge, Mass.

the levers may be made to act so that the catch (*I*) will take any desired number of teeth by every revolution of the object. The knife moves only during that part of the revolution when the object is not in contact with the knife. The ribbon of sections slides downward from the knife and is caught on a piece of paper placed upon the table.

The wheel holding the object, as well as the razor, can be moved so that almost all parts of the edge of the razor can be used.

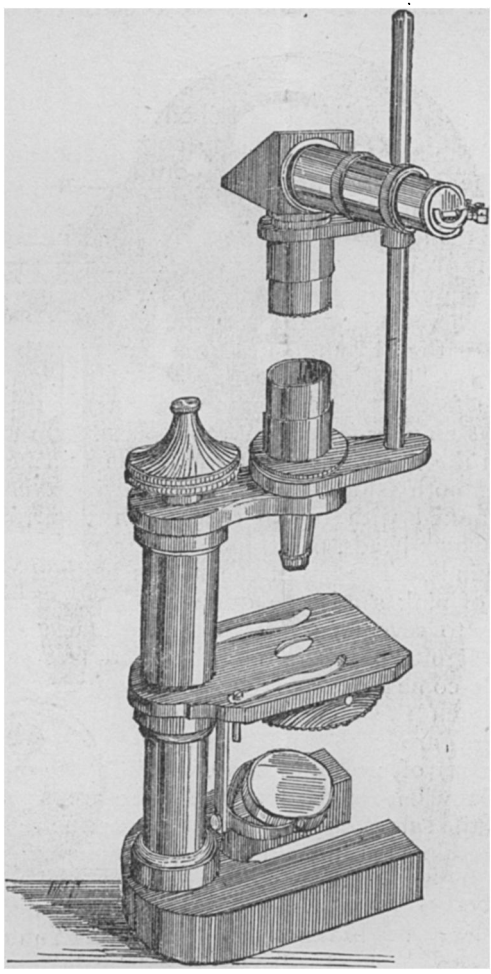


The frame bed of the microtome is made of iron, the screw of steel, and all the rest is brass. Any ordinary microtome knife or razor may be used.

The machine has been in use for a year and gives the greatest satisfaction. It can be used with great rapidity, but so far the best results have been obtained at a rate of not over a hundred sections to the minute. The only possible error in a revolving microtome of this kind is theoretical—namely, that owing to the circular motion of the object, each section is part of a hollow

cylinder. But in reality, with objects of ordinary size, this error is not apparent, and even under a high magnifying power there is no perceptible difference between sections cut by this microtome and those cut by ordinary slide microtomes.

EMBRYOGRAPH FOR USE WITH ZEISS MICROSCOPES.—This piece of apparatus, which is the work of Adam Pfeifer, the instrument-



maker of the Biological Laboratory of the Johns Hopkins University, renders the Zeiss-Oberhausen camera available for drawing objects under very low magnifying powers. It consists, first, of a collar fitted to the arm of the microscope, and furnished with a short draw-tube, which can be placed with the objective either above or below the arm; and second, of a vertical rod, supported

on an arm which is clamped under the collar of the draw-tube, and carries a second movable arm resting in a collar to support the camera. This arm is held in place by a thumb-screw, and it may be set at any point on the vertical rod. When the Zeiss *a.a.* objective is used, and the camera is lowered as much as possible, an image magnified about three diameters is projected on to the paper, and any amplification greater than three diameters may be obtained by varying the height of the camera, and by the use of the higher objectives.

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SCIENTIFIC NEWS.[1]

— One of the most remarkable salt formations in the world is located on the Isle of Petit Anse, Southwestern Louisiana, 125 miles due west from New Orleans. It is owned by the Avery family. This singular salt deposit is sufficiently unknown to bear the light of a more thorough investigation than it has had. The deposit is pure crystal salt. So far as it has been traced, there are 150 acres of unknown depth, explored 140 feet down. The surface of the bed undulates from one foot above to six below tide-level. The earth covering the salt ranges from ten to twenty-three feet in depth, but one hill rises 183 feet above, showing that an after-formation took place. On the top of the salt, beneath the earth, have been found the remains of the mastodon, mammoth sloth, horse (*Equus fraternus*), tusks and bones intermixed with Indian relics such as arrow and spear points, tomahawk heads, paint pots, mortar and pestle and pottery of all kinds. The dip of the salt is eight degrees. There is a deposit of pink sandstone quite decomposed, a coal formation thirteen to seventeen feet thick and seventy-two per cent carbon, the lignite cropping out a hundred feet above the sea. Over the salt come pink and yellow clay beds, then the sandstone and then the clay, each stratum trending towards the north. There are also sulphur springs. The salt is a conglomerate mass of crystallizations, which in the mine look like dark salt, but when exposed to the light are seen to be white. By analyses the salt is $99\frac{88}{100}$ per cent pure; the remaining $\frac{3}{25}$ is made up of sulphate and chloride of calcium. The position of the salt shows it to be older than the coal and sandstone which lie above it, and also the mastodon and contemporary prehistoric mammals. The deposit was discovered in 1862 while a well was being excavated. It was seized by Jefferson Davis and afterward by Admiral Farragut. It is now worked by a New York concern which pays the Averys $5000 per month royalty. To show the value of land here, it may be stated that a single acre, on which grow little peppers, yields a clear profit of $10,000 per year on the well-known Tobasco table sauce.

[1] Edited by WM. HOSEA BALLOU, 265 Broadway, New York.